

Revision of the Genus *Pandanus* Stickman, Part 21 The *Pandanus monticola* Group in Queensland, Australia

HAROLD ST. JOHN¹

IN AUSTRALIA the section *Acrostigma* of the genus *Pandanus* occurs only in the rain forests of eastern Queensland. The first known species there was *P. monticola* F. Muell. It is here given a full description and illustrations, as is one new species segregated from it.

Section *Acrostigma*

Pandanus monticola F. Muell. (sect. *Acrostigma*), Fragm. Phytog. Austral. 5:42, 1865; 7:63, 1870; 8:220, 1874; Martelli, Webbia 4(2):pl. 30, fig. 21-27, 1914
Figs. 232-234

DESCRIPTION (from St. John 26,237): Shrubs 1-3 m tall, simple, erect or decumbent; stem 25-40 mm in diameter, yellowish, unarmed, bearing in a terminal plume the arching leaves 1.8-2.18 m long, 4 cm wide near the base, 4.2 cm wide at the middle, subcoriaceous, ligulate, gradually long tapering to a subulate tip which 10 cm down is 7 mm wide, the very base unarmed and amplexicaul but beginning 5 cm up the margins with spines 1.5-2 mm long, 1.5-5 mm apart, the lowest ascending but the others salient, subulate, stramineous; the nearby midrib with prickles 0.5-0.8 mm long, 1.5-6 mm apart, the base thick like a boss, the apex reflexed and subulate-conic; at the mid-section the margins with prickles 0.5-0.9 mm long, 2-5 mm apart, subulate, appressed ascending; the nearby midrib unarmed; near the tip the margins and midrib below with the teeth 0.3-0.5 mm long, 1-3 mm apart, subulate-serrate, ascending, above the two pleats with teeth 0.5-0.7 mm long, similar but broader-based and occasionally double; pistillate inflorescence terminal, erect, 2-headed, the upper syncarp larger, but with a small, secon-

dary, subterminal one below; peduncle 50 cm long, 1 cm in diameter, trigonous, leafy bracted, the middle bracts 65 cm long, 3.4 cm wide; the larger syncarp 9.5 cm long, 7.5 cm in diameter, ovoid, bearing very numerous drupes, these 24-28 mm long, 2-3 mm wide, 1.5-2.5 mm thick, yellow, narrowly lance-subulate, 4-6-angled, upper $\frac{3}{4}$ free; pileus 13-14 mm long, subulate, sharply angled on drying, the surface smooth, the tip curved toward the apex of the syncarp; style 6-8 mm long, subulate, cartilaginous, yellowish, smooth, arcuate; stigma distal, 5-6 mm long, linear, brown; endocarp in lower ninth, 4-6 mm long, cartilaginous, yellowish, the walls 0.1 mm thick; seeds 4 mm long, broad oblong-ellipsoid; apical mesocarp with a central core of fibers and with fleshy sides; basal mesocarp very small, fibrous and fleshy.

HOLOTYPE: Australia, Rockingham's Bay proximis (staminate only), (MEL), specimen examined! This was published as "montibus sinu Rockingham's Bay proximis." Isotype (κ)! In the Paris herbarium there is an original collection, with part of a leaf and half of a syncarp, that is a far better specimen than the holotype preserved in Melbourne. It was distributed by von Mueller in 1874, and the data is in his handwriting: "Rockingham's Bay, on mountains, most probably this belongs to *P. monticola*, of which I had no flowers, when I described it, fruit small, bracts white." (P)!

SPECIMENS EXAMINED: Queensland, without locality, L. J. Brass 2,128 (A); in valle Dalrymple, 22 Oct. 1864, J. Dallachy (MEL); Russell River, F. von Mueller (MEL); Mt. Bellenden-Ker, 1895, Mrs. Gribble (MEL); Cairns, Fresh Water Creek, common, moist forest, 500 ft alt, Jan. 29, 1958, H. St. John 26,237 (BISH).

¹ B. P. Bishop Museum, Honolulu, Hawaii. Manuscript received December 3, 1962.

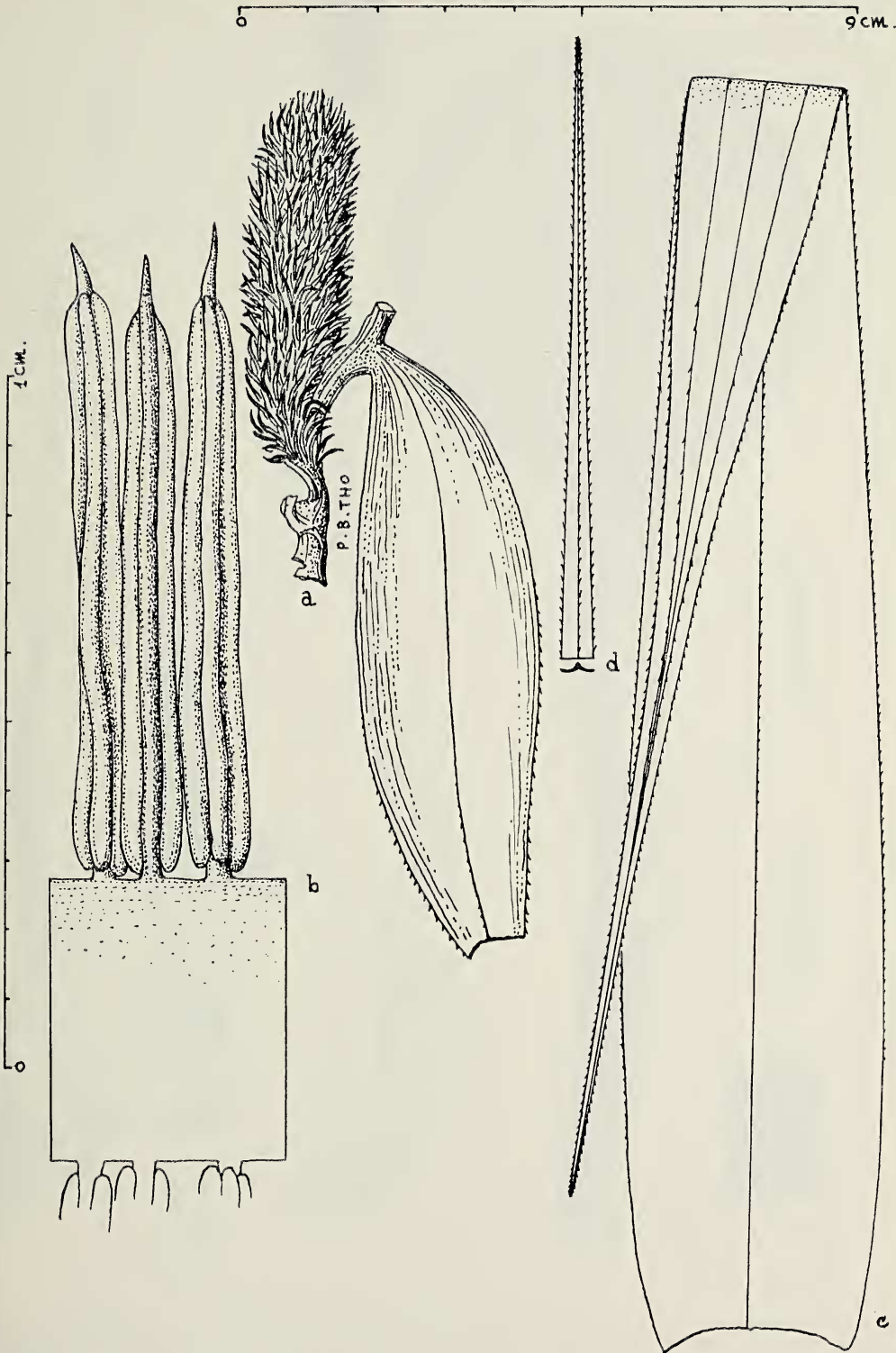


FIG. 232. *Pandanus monticola* F. Muell., from holotype. *a*, Staminate spike and bract, $\times 1$; *b*, stamens and axis, $\times 10$; *c*, leaf, showing upper side of apex, $\times 1$; *d*, leaf apex, lower side, $\times 1$.

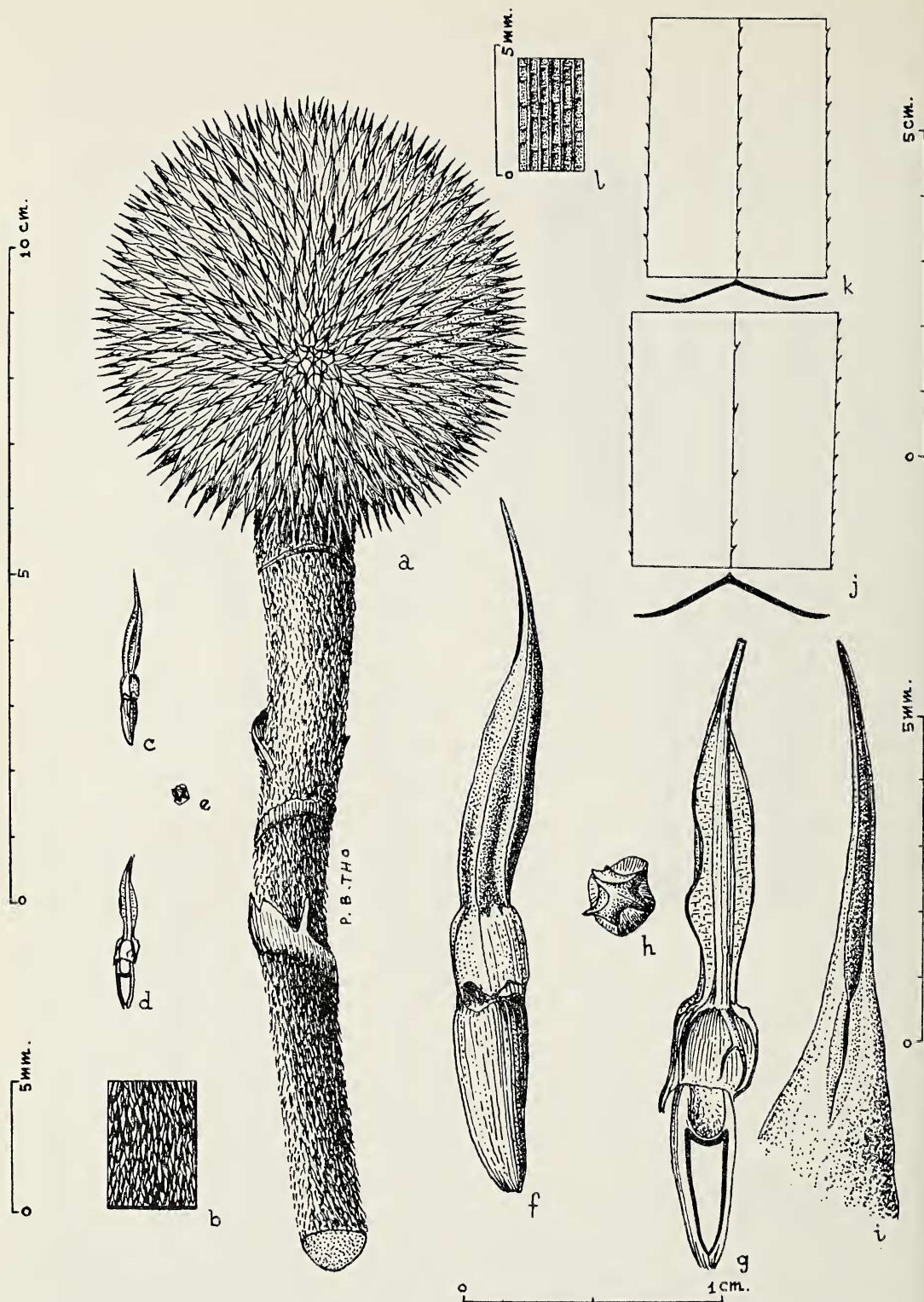
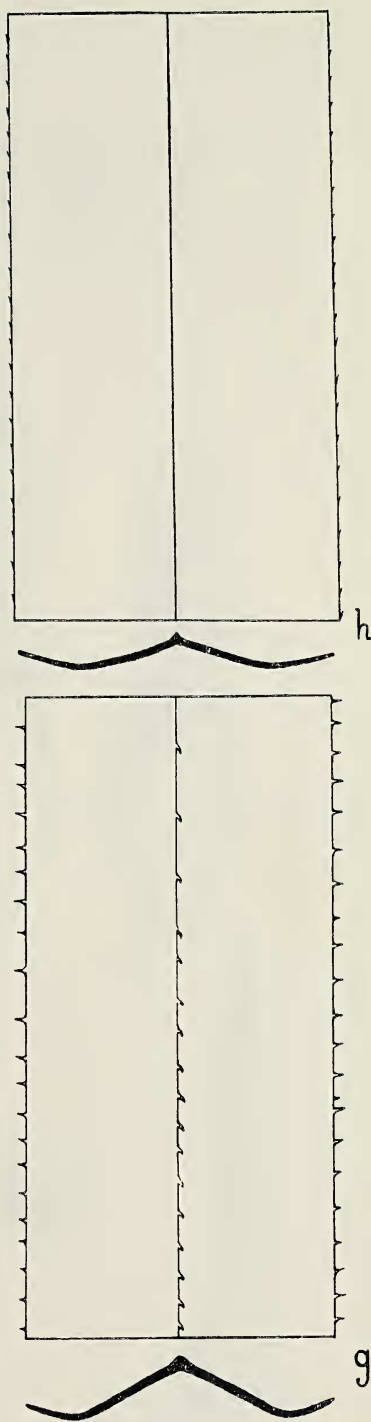
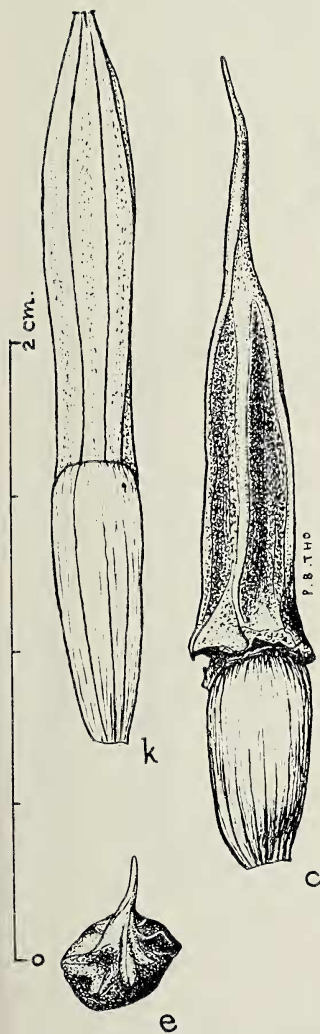
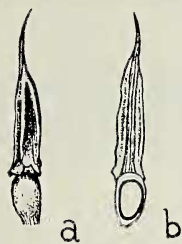


FIG. 233. *Pandanus monticola* F. Muell., from Queensland, Russell R., 1886, F. von Mueller (MEL). *a*, Syncarp and peduncle, $\times 1$; *b*, part of peduncle, $\times 4$; *c*, drupe, lateral view, $\times 1$; *d*, drupe, longitudinal median section, $\times 1$; *e*, drupe, apical view, $\times 1$; *f*, drupe, lateral view, $\times 4$; *g*, drupe, longitudinal median section, $\times 4$; *h*, drupe, apical view, $\times 4$; *i*, style and stigma, $\times 10$; *j*, leaf base, lower side, $\times 1$; *k*, leaf middle, lower side, $\times 1$; *l*, venation of lower leaf surface, $\times 4$.

0 2 cm.



0 5 cm.

FIG. 234. *Pandanus monticola* F. Muell., a-j from *St. John* 26,237; k, from "valle Dalrymple," *J. Dalrymple* (MEL). a, Drupe, lateral view, $\times 1$; b, drupe, longitudinal median section, $\times 1$; c, drupe, lateral view, $\times 4$; d, drupe, longitudinal median section, $\times 4$; e, drupe, apical view, $\times 4$; f, style and stigma, $\times 4$; g, leaf base, lower side, $\times 1$; h, leaf middle, lower side, $\times 1$; i, leaf apex, lower side, $\times 1$; j, leaf apex, upper side, $\times 1$; k, drupe, lateral view, $\times 4$.

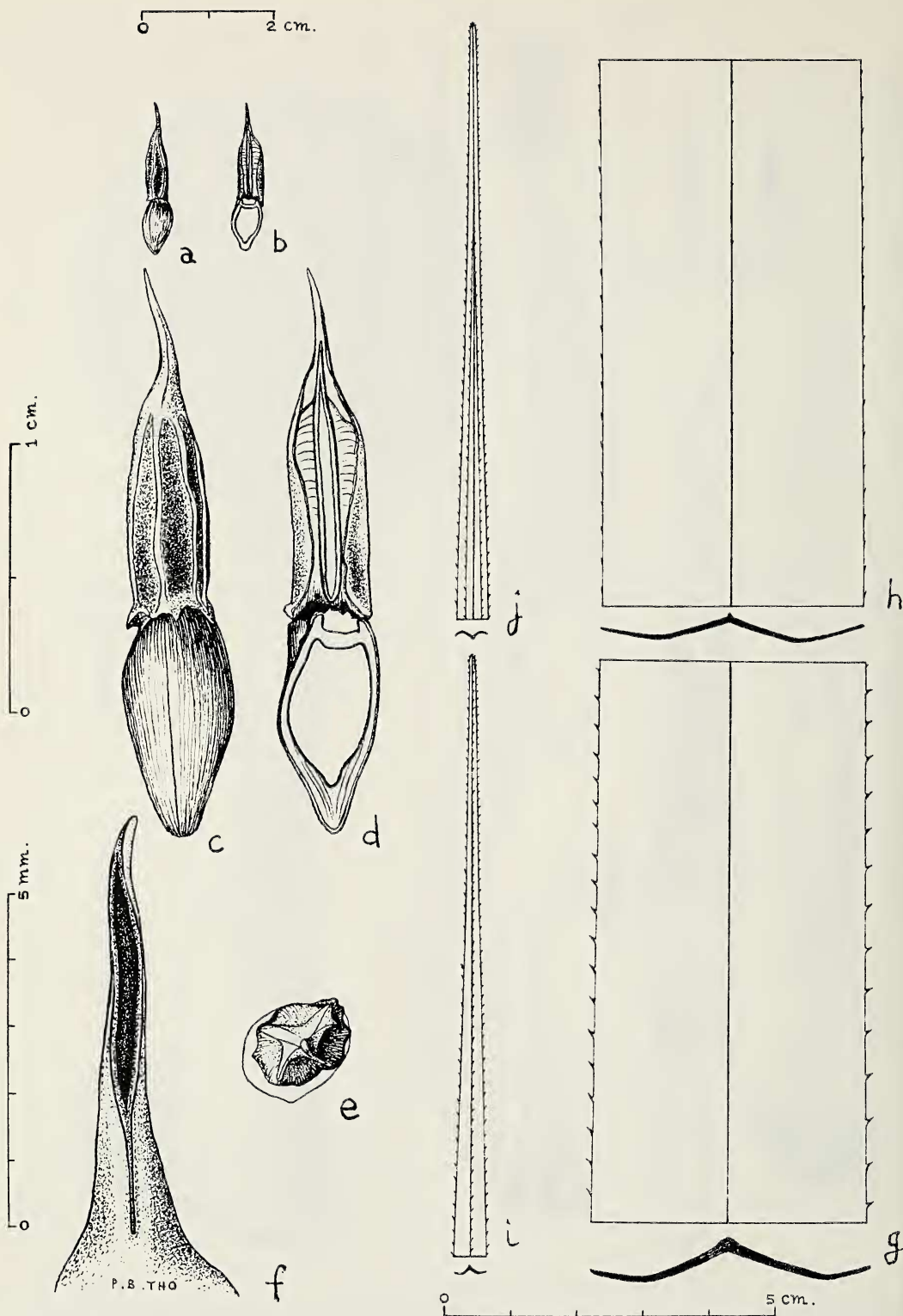


FIG. 235. *Pandanus pluvisilvaticus* St. John, from holotype. *a*, Drupe, lateral view, $\times 1$; *b*, drupe, longitudinal median section, $\times 1$; *c*, drupe, lateral view, $\times 4$; *d*, drupe, longitudinal median section, $\times 4$; *e*, drupe, apical view, $\times 4$; *f*, style and stigma, $\times 10$; *g*, leaf base, lower side, $\times 1$; *h*, leaf middle, lower side, $\times 1$; *i*, leaf apex, lower side, $\times 1$; *j*, leaf apex, upper side, $\times 1$.

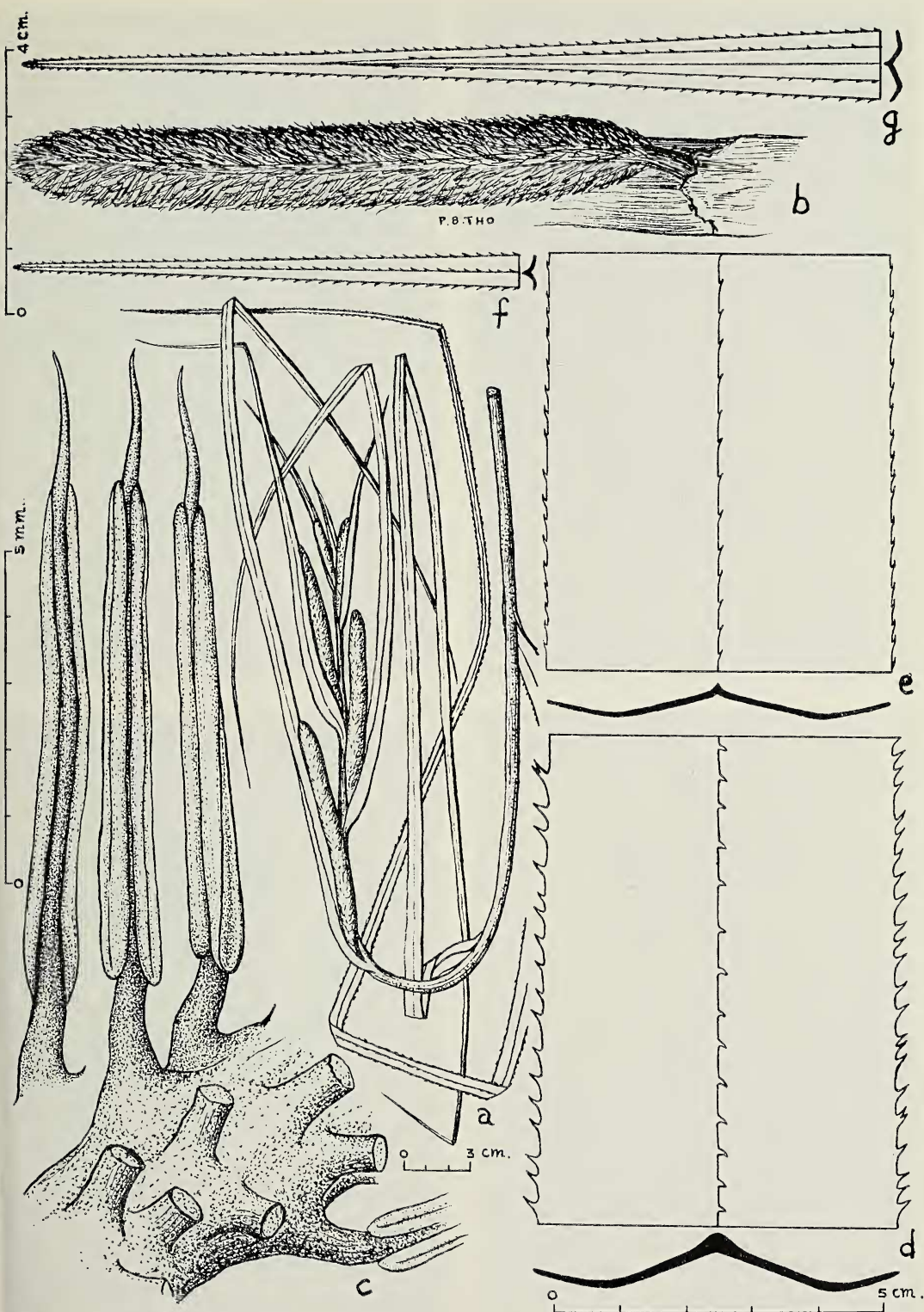
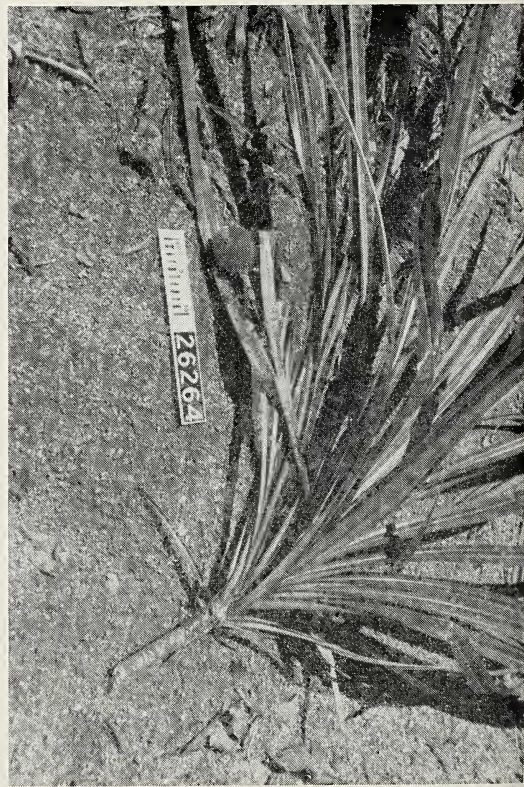
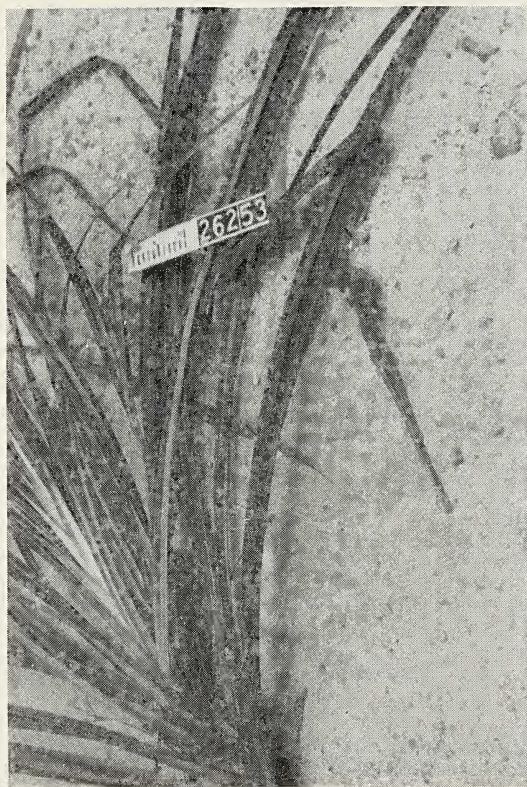
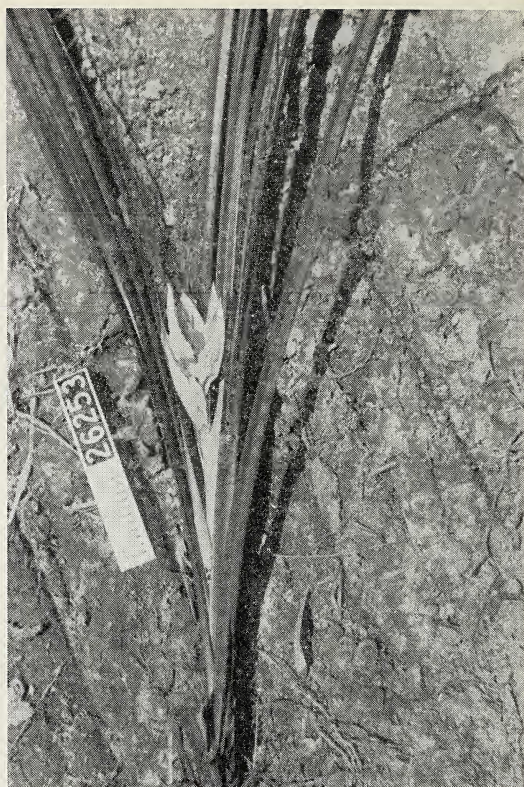


FIG. 236. *Pandanus pluvialisilvaticus* St. John, from *St. John* 26,254. *a*, Staminate inflorescence, $\times 1/3$; *b*, staminate spike, $\times 1$; *c*, stamens and axis, $\times 10$; *d*, leaf base, lower side, $\times 1$; *e*, leaf middle, lower side, $\times 1$; *f*, leaf apex, lower side, $\times 1$; *g*, leaf apex, upper side, $\times 1$.



DISCUSSION: *P. monticola* F. Muell. belongs in the section *Acrostigma*. Its author, Baron von Mueller, published upon it three times. In 1865 he published the binomial for it as a doubtful species, and gave a casual reference to fruit characters. The type locality was Rockingham's Bay, but the authenticating specimen preserved in the Melbourne herbarium, collected in 1864 by J. Dallachy, consists of one leaf and parts of a staminate inflorescence. This is taken to be the holotype.

His second publication, in 1870, was based upon study of a collection from "valle Dalrymple," also by J. Dallachy. Here, von Mueller positively adopted the species and gave a good description, including characters of the scarlet fruit.

In 1874 he published on it a third time, supplementing the herbage characters, and describing the staminate flowers.

Pandanus pluvisilvaticus sp. nov. (sect. *Acrostigma*)

Figs. 235-237

DIAGNOSIS HOLOTYPI: Frutex 4 m altus, caulibus plerumque simplicibus 3 cm diametro erectis inermibus, radicibus fulturosus nullis, foliis 1.45-1.66 m longis proxima basem 4.1 cm latis in medio 3.8-3.9 cm latis ligulatis subcoriaceis supra viridibus infra pallide viridibus sensim in apice subulato diminuentibus eo in puncto 10 cm ex apice 4.5 mm lato in sectione M-formatis, basi inermi amplexicauli sed ex 2.5-3 cm marginibus cum aculeis 1.5-2 mm longis 2-5 mm separatis subulatis adscendentibus stramineis, midnervo proximali inermi, in sectione mediali marginibus cum aculeis 0.5-1 mm longis 3-7 mm separatis subulatis adpresse adscendentibus, midnervo infra proximali cum aculeis 0.3-0.5 mm longis 5-10 mm separatis subulatis adscendentibus, proxima apicem marginibus et midnervo infra subulatoserratis dentibus 0.4-0.6 mm longis eis marginalium 1-2 mm separatis illis midnervi 2-5 mm separatis, supra plicis lateralibus cum serrulis 0.5-0.8 mm longis 2-5 mm separatis, inflorescentia foeminea terminali, pedunculo 44

cm longo 7-8 mm diametro acute trigono cum bracteis foliosis paucis superiore 39 cm longa 2 cm lata, syncarpio ex 6-7 bracteis albis subpetaloideis sustento, eis medialibus superisque 7-10 cm longis 3 cm latis lanceolatis minute aciculari-ciliatis, syncarpio 6 cm longo 5.5 cm diametro latiter obovoideo solitario terminali erecto cum drupis multis adpressis, drupis 20-22 mm longis 4 mm latis 3 mm crassis rubris pilei 6.5-12 mm longo 5-6-anguloso libero corpore laevi ellipsoideo sed argute anguloso, parte $\frac{3}{5}$ supera libera, stylo 3.5-4.5 mm longo subulato subcurvato plerumque distaliter curvato, stigmatibus 3-4 mm longo lineari distali brunneo papilloso, endocarpio in parte $\frac{1}{4}$ infera 7 mm longo cartilagineo luteo lateribus 0.2 mm crassis in apice in lateribus cavernae extento, semine 5 mm longo 3-4 mm diametro latiter ellipsoideo sed in apice concavo, mesocarpio apicali in centro cum fibris fortibus et cum lateribus carnosus, mesocarpio basali sparso fibroso et carnoso.

DESCRIPTION OF ALL SPECIMENS EXAMINED: Shrub 4 m tall; stems mostly simple, pale brown, 3 cm in diameter, erect, unarmed; prop roots none; leaves 1.45-2.33 m long, 3.8-5.4 cm wide near the base, 3.3-5.1 cm wide at the middle, ligulate, subcoriaceous, green above, pale green below, gradually tapering to the subulate apex, this 10 cm down 4.5 mm wide, in section M-shaped, the base unarmed, amplexicaul but beginning at 2.5-3 cm up the margins with prickles 1.5-2 mm long, 1-5 mm apart, subulate, ascending, stramineous, the nearby midrib unarmed, or with reflexed prickles 1-1.5 mm long, 2-5 mm apart; at midsection the margins with prickles 0.5-1 mm long, 3-7 mm apart, subulate, appressed ascending; the nearby midrib below with prickles 0.3-1 mm long, 3-10 mm apart, subulate, ascending; near the tip the margins and midrib below subulate-serrulate, the teeth 0.4-0.6 mm long, those of the margins 1-2 mm apart but those of the midrib 2-5 mm apart; above the lateral pleats with ascending serrulations 0.5-0.8 mm long, 2-5 mm apart; pistillate inflores-

FIG. 237. *Pandanus pluvisilvaticus* St. John. a-c, From holotype: a (upper left), habit, and figure of Dr. S. T. Blake of Brisbane; b (upper right), inflorescence in anthesis, showing the white bracts; c (lower left), leafy branch with mature syncarp; d (lower right), from St. John 26,264, leafy branch with mature syncarp.

cence terminal; peduncle 35–65 cm long, 7–8 mm in diameter, sharply trigonous, with a few leafy bracts, the uppermost one 39 cm long, 2 cm wide; syncarp subtended by 6–7 pure white, subpetaloid bracts, the middle and upper ones 7–10 cm long, 3 cm wide, lanceolate, finely acicular ciliate; syncarp 6–11 cm long, 5.5–7 cm in diameter, broadly obovoid, single, terminal, erect, bearing numerous, crowded drupes, these 20–28 mm long, 4 mm in diameter, 3 mm thick, red to orange; pileus 5–6 angled, upper $\frac{1}{2}$ – $\frac{3}{5}$ of drupe free, pileus 6.5–12 mm long, the surface smooth, the body ellipsoid but with sharp ridges and deep rounded valleys; style 3.5–4.5 mm long, subulate, slightly curved, usually away from apex of syncarp; stigma 3–4 mm long, distal, linear, brown, papillose; endocarp in lower $\frac{1}{4}$, and 7–11 mm long, cartilaginous, yellowish, the walls 0.2 mm thick, and at its summit enclosing all but the top of a fat discoid cavity; seed 5–6 mm long, 3–5 mm in diameter, broad ellipsoid except for the concave apex; apical mesocarp with strong central fibers and soft pith forming the side tissues; basal mesocarp sparse and this fibrous and fleshy.

Staminate plants 10 m tall, 20 mm in diameter; prop roots none; leaves 2.4 m long, 5 cm wide near the base but at the middle 5.2 cm wide, the base amplexicaul, entire, beginning 5–6 cm up the margins with spines 2–3 mm long, 1–6 mm apart, stout serrae with subulate tips, single or a few doubled or trebled, yellowish; the midrib below beginning at 12.5 cm up with stout retrorse serrae, 1–1.5 mm long, 2–8 mm apart; at the midsection the margins with teeth 1–1.5 mm long, 3–6 mm apart, subulate, appressed ascending; the midrib below sharp, raised, with similar teeth, but heavier based; near the apex the margins and the midrib below and the two secondary pleats above with serrae 0.8–1 mm long, 1–2 mm apart; the blade gradually narrowed to the subulate trigonous apex, the very tip lost, but about 10 cm down the tip 10 mm wide; staminate inflorescence 65 cm long, sparsely leafy bracted, the middle bract of the peduncle 110 cm long, 6 cm wide, foliaceous, the midrib below and the margins spiny to serrate, the apex subulate, the peduncle 40 cm long, the main raceme with 8–10 lateral racemes, each

subtended by a white, semipetaloid bract, the lower ones 40 cm long, 3 cm wide, the apical half green and foliaceous; lateral racemes 6–10 cm long, including the 5–7-mm stipe, 15 mm in diameter, densely flowered; stamens distinct; free filament 0.7–1.6 mm long; anthers 6–7 mm long, linear, yellow, bearing an apical prolongation of the connective 1–2 mm long, subulate.

HOLOTYPE: Australia, North Queensland, Kuranda, Black Mt. Road, rain forest with *Acacia*, *Calamus*, and *Gabnia*, 1,000 ft alt, Feb. 4, 1958, *H. St. John* 26,253 (BISH).

SPECIMENS EXAMINED: Australia, North Queensland, 11 miles N. of Mossman, rain forest with *Calamus*, *Myristica*, and *Hibiscus tiliaceus*, 20 ft alt, Feb. 6, 1958, *St. John* 26,264 (BISH); 5 miles N. of Gadgarra Forest Station, 5 miles E. of Yungabarra, rain forest, 2,130 ft alt, Feb. 11, 1958, *St. John* 26,277 (drupes sterile) (BISH); Bloomfield R., 1883, *Barnard* (MEL); Russell R., 1886, *F. von Mueller* (MEL); near Mulgrave R., [*F. von Mueller*] 144 (MEL); Daintree R., 1882, *Pentzke* (MEL); 11 miles N. of Mossman, rain forest with *Calamus*, *Myristica*, *Hibiscus tiliaceus*, 20 ft alt, Feb. 5, 1958, *St. John* 26,263 (BISH).

DISCUSSION: *P. pluvisilvaticus* is a member of the section *Acrostigma*, as is its closest relative *P. monticola* F. Muell., a species with the endocarp 4–6 mm long, and with the seed forming $\frac{1}{4}$ – $\frac{1}{3}$ of the drupe; pileus 13–14 mm long; stigma 5–6 mm long; anthers oblong-linear; free filament tips 0.1–0.2 mm long; and the leaves 32–43 mm wide. *P. pluvisilvaticus* has the endocarp 7–11 mm long, and with the seed forming $\frac{2}{3}$ – $\frac{1}{2}$ of the drupe; pileus 6.5–12 mm long; stigma 3–4 mm long; anthers tapering upward; free filament tips 0.7–1.3 mm long; and the leaves 36–58 mm wide.

P. pluvisilvaticus is actually a common species, but it has been confused with the rather poorly described *P. monticola* F. Muell., which occurs in eastern Queensland in the rain forests at from 18° to 21° South. It has been reported by von Mueller from the Russell River at 17° 30' South, but he also had a col-

lection of *P. monticola* with exactly duplicating data. There may have been a confusion in the data of these two collections.

P. pluvisilvaticus occurs in the rain forests of eastern Queensland from 17° to 16° South, and is known from numerous collections. It shows some variability in the width of the leaf blades and considerable variation in the

leaf spines, but it seems to represent a taxon of fairly wide distribution. Its fruit characters are dependable as a basis for separation from the older *P. monticola* F. Muell.

The new epithet is coined from the Latin *pluvia*, rain, and *silvaticus*, woodsy, and is given with reference to the habitat of the species, the rain forest.